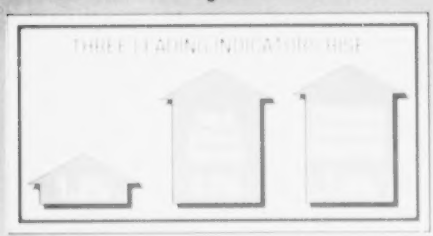
# PACKAGING

THE CAHNERS MAGAZINE FOR DECISION-MAKERS/JANUARY 1992

# ANNUAL FORECAST ISSUE

## Expert Panelists See Better Days Ahead



## Cover Story: Color Guides Keep Packages Sparkling

## New Accuracy Comes To Dry Fillers

## Technical Changes Boost Paperboard Performance

# PACKAGING

A CAHNERS PUBLICATION
VOLUME 37 NUMBER 1

'92 THIRD ANNUAL FORECAST

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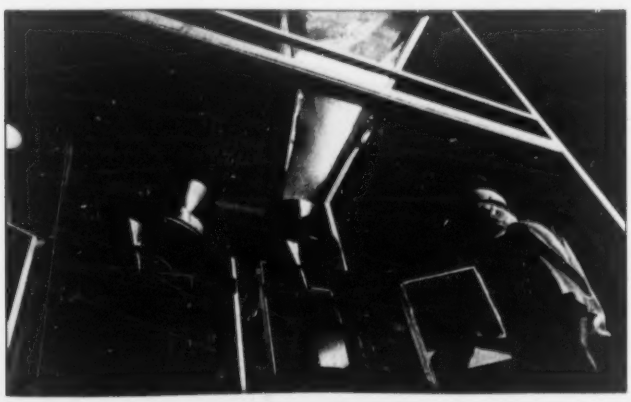
**Dry fillers** utilize electronics to help improve accuracy and increase speed. Page **50**

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## NEXT MONTH

**What makes a drug jump off the shelf?** The fact remains that stores stock what sells. Which packaging details give your product an edge with leading pharmaceutical retailers?

**Organoleptics: the war for better flavor.** In the great struggle to make food packaging materials flavor-neutral, important battles are being won.

**Line managers face the challenge of worker training.** Today's sophisticated packaging machines call for skilled operators, but where do you find them?

**Plastics recycling hits its stride.** The pages of PACKAGING Magazine have recorded the progress of plastics recycling from a few experiments in 1987 to widespread success today.

## COMING SOON

Ever wondered what all those bright kids enrolled in university packaging programs have been brainstorming about? Find out in our report on "Wild Ideas From Students."

In describing packaging that's doing its part to preserve the environment, terms like "green" and "friendly" have been used with varying success. PACKAGING now coins a new term—Low-Impact Packaging—and showcases memorable examples of source reduction.

**Package design** balances European flair and American convenience. Page **18**

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## PACKAGING CONFIDENCE INDEX

# Though optimism wanes, there's reason for hope

**Kermit Baker**
Chief Economist
Cahners Economics

A new measure of business expectations for the packaging industry has been developed by Cahners Economics and PACKAGING Magazine: The PACKAGING Magazine Business Confidence Index. We'll be reporting current changes in the index each month right here.

This exclusive index measures business confidence as indicated by actual plans of operating managers in consumer and manufacturing industries.

### Not-so-great expectations

Expectations are usually considered a leading indicator of performance, so if businesses continue to feel positive about business conditions, spending will follow. The index tracks changes in hiring, production, marketing, new product introduction, inventories, capital spending, and R&D.

The latest, continued gloomy, reading for December 1991, stood at 57.1, dipping from 57.9 in November. Although confidence in general appears to have dropped, any reading over 50 is still a positive sign.

### Most still plan to expand

Readings at these levels still indicate that most businesses plan to expand operations. However, a decline in the index means that business plans softened a bit in December in response to less-favorable business conditions or concern over future business prospects.

Overall, while businesses continue to plan for improved conditions, optimism is waning. Between June 1991—about the time the current expansion began—and the latest reading in December, the index dropped a total of 6.2 points. The highest reading came in August when the index measured 65.5.

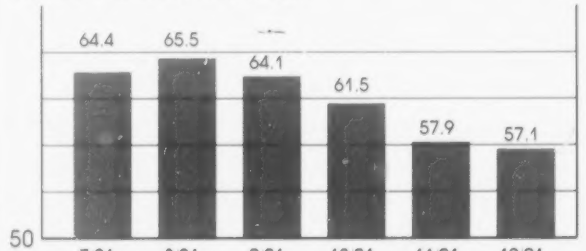
A revision of disposable income figures, based on 1987 dollars, has shown that real disposable income weakened in 1991 and is forecast to be down 0.2% compared to 1990. Disposable income in 1992 is anticipated to grow 0.8%—a positive sign for future consumer spending.

Grocery store sales have been lagging recently and ended 1991 down 0.2%, but are expected to climb a real 0.6% in 1992. Food shipments, which have been slowing lately, are forecast to pick up steam by the second quarter of 1992 and grow 3.0% by the end of the year.

*Research assistance:*
*Lori Brassaw, Economist*
*Cahners Economics*

**BUSINESS CONFIDENCE SLIPS AGAIN IN DECEMBER**

Although the PACKAGING Business Confidence Index fell for the fourth straight month in December 1991, it remained above 50, reflecting more optimism than pessimism among members of the survey group.




Source: Cahners Economics

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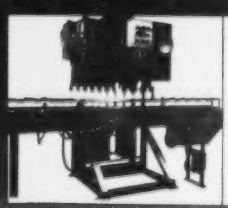

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# ENVIRONMENTAL NEWS

## 500 Solid Waste Bills Introduced In 1991

Lawmakers in 48 states brushed off economic recession and war in the Persian Gulf to introduce more than 500 solid-waste management proposals involving the plastics industry in 1991. The level of state legislative activity equaled 1990's record pace, according to the Council For Solid Waste Solutions.

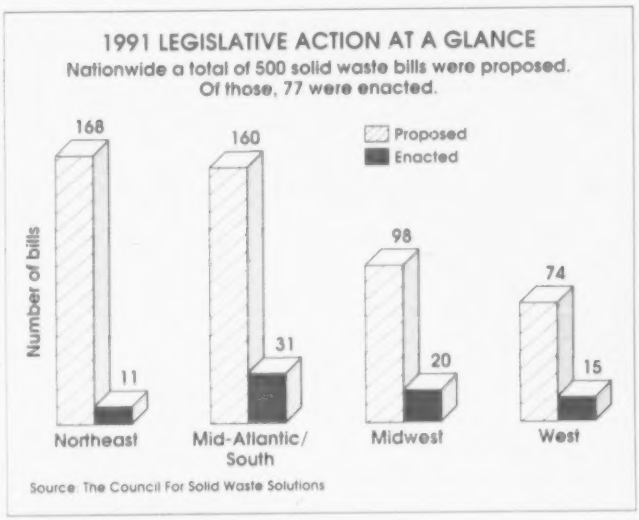
In 1991, legislative pressures on the plastics industry shifted from product bans to proposals that would impose strict recycling-rate and recycled-content criteria on entire categories of packaging.

The Council's Government Affairs Dept. tracked each of the 500 proposals introduced in 48 state legislatures, four more states than in 1990. A close analysis of these proposals, including those that were enacted into law, confirms that the plastics industry has again succeeded in protecting the marketplace from severe, state-imposed restrictions on its products.

Specifically, 42 bills were introduced at the state level mandating recycled content for packaging and two proposals were passed affecting plastics packaging. Nationwide, 104 bills were introduced requiring that plastics meet a recyclability or degradability standard; 12 of those have been enacted.

Lawmakers are apparently becoming aware of the limitations of degradability mandates in easing the solid-waste crisis. This may account for the fact that only 83 proposals calling for degradable plastics were introduced in state legislatures in 1991, compared with 190 last year.

"Even though the Council again succeeded in protecting the marketplace from severe, state-imposed restrictions on plastic products, legislative intensity is expected to reach its crest during 1992," says Rodney Lowman, CSWS vice president of government affairs.




## New Jersey PS Recycling Center Is East's Largest

The largest polystyrene recycling plant in the east was recently opened in Bridgeport, N.J., by the National Polystyrene Recycling Co. and CRInc. Recycling. The new plant will recycle polystyrene from the entire eastern seaboard.

The facility, operated by CRInc., has the capacity to annually recycle 13 million pounds of post-consumer polystyrene foodservice and non-food packaging such as foam cushioning.

"With the opening of our Bridgeport facility, NPRC significantly increases the amount of polystyrene that can be recycled in the East," says E. James Schneiders, president. "We are working closely with the foodservice and protective-packaging industries . . . to build the volume necessary to operate the plant at capacity.

"Our initial objective is to increase the number of existing polystyrene recycling programs by focusing our attention on the largest users of polystyrene, such as schools, hospitals, restaurants and businesses, as well as the producers of polystyrene packaging materials," says Schneiders.

**Recycling earned these teens** $3,000 for a working vacation helping the poor, plus top prize in Alcoa's annual aluminum recycling contest

## Teens Win Cash For Good Recycling Deeds

Teens recycling to help the poor earned top prize in this year's Alcoa Best Recycling Story Contest. The eight-year-old contest evaluated more than 200 entries in the categories of "Best Individual Recycling Story" and "Best Municipal Recycling Story."

A group of 27 teens from the Asbury Methodist Church in Little Rock, Ark., nabbed the individual recycling prize of $500 by recycling over $3,000 worth of aluminum beverage cans to fund their own "working vacation" helping the elderly and poor at the Ozark Mission Project.

Top municipal winner was Coral Gables, Fla. The city operates an aggressive curbside aluminum collection program that reportedly garners 95% resident participation.

## Recycling Gets Wheels In Calgary

In an encouraging private industry partnership, Novacor Chemicals of Calgary, Alberta, and Safeway stores in the Calgary area recently unveiled a specially painted semi-trailer that will be used to collect, compact and haul post-consumer plastic scrap from Calgary to a nearby plastic recycler.

The City of Calgary is evaluating collection techniques for paper, glass and metal in some areas of the city. The test program does not include plastic. Novacor worked with Safeway to add plastic to an existing glass, paper and metal collection program at neighborhood Safeway store locations. The retail chain schedules a recycling day once a month on a rotating basis among its Calgary-area stores.

Novacor employee volunteers help consumers sort plastic scrap by material type and pass out literature with tips on preparing plastic for recycling. The separated scrap is compacted and transported on the new trailer to Polymont Plastics in nearby Red Deer. A phone number painted on the side of the vehicle invites Calgary-area community groups to call and book the trailer to host their own plastic recycling event.

# Meeting of minds by leading analysts leads to realistic composite outlook

# '92

*If all economists were laid end to end, they would not reach a conclusion.*
—George Bernard Shaw

**Greg Erickson** Editor in Chief
All right, if we can't hope for a conclusion among economists, we can still strive for agreement in principle among market research professionals.

Think of this PACKAGING special report as a day-long forecasting seminar that you can put in your briefcase.

In assembling it, PACKAGING's editors requested concise essays about the next 12 months and beyond from a number of leading observers of the packaging field. Their responses are published here verbatim, having been edited only to fit the space available. Note: The opinions expressed in these essays do not necessarily represent the opinions of PACKAGING magazine or Cahners Publishing Co.

Though these respected analysts differ on some of the fine points, they do indeed tend to agree on the big picture: The packaging field will see growth in 1992 over 1991.

## Consumers Prove Key To Recovery

**Kermit Baker**
Chief Economist
Cahners Economics

Unlike past recoveries, the current economic resurgence lacks consumer purchasing vigor, noticeable employment increases and fast-paced production lines. This economic recovery is proving to be mild. Still, it will lead to growth in virtually all packaging markets by the end of 1992.

**Concerned about** the economic climate, consumers remain cautious in their spending. In fact, consumers are currently using much of their disposable income to pay off accumulated debt. As debt levels decrease, consumers will again increase their puchasing.

Total consumer spending on durables and nondurables

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*Cahners Economics, the research and forecasting arm of Cahners Publishing Co., produces a series of widely followed forecast newsletters and the* Cahners Economic Outlook, *published annually.*

## Flexibility Boosts Packaging Machinery

**Darrin Brogan**
Research Analyst
The Freedonia Group

Packaging machinery shipments, which totaled approximately $2.6 billion in 1991, will increase 7% in 1992, reaching $2.8 billion. Gains will be based on several factors including industry globalization, demand for more flexibility, sophistication and versatility plus heightened end-user demand coming out of the recession.

**Imports and exports** are expected to grow substantially through the end of the decade, as both increase their share of total packaging machinery demand. Exports are expected to grow at a faster pace, however. This will reflect the low dollar, expanding opportunities in foreign markets, and technological

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*The Freedonia Group Inc., Cleveland, Ohio, is a business database/research company that provides detailed industry analyses and forecasts and competitive intelligence services.*

## Future Looks Bright For Health Care, Aseptics

**Shiela A. McDonald**
Frost & Sullivan Inc.

If the market for health-care products, medical and pharmaceutical, is recession-proof—as it seems to be—clearly so is the market for plastics used in packaging those products. Despite general economic uncertainty, there is no downturn in sales of resins destined for health-care packaging.

**It's a market on the rise,** from total sales of 1.27 billion pounds in 1989 to over 1.52 billion pounds in 1992 and 1.83 billion pounds in 1995. Total sales are predicted to climb from $642 million in 1989 to $777 million in 1992 and $954 million in 1995 (constant 1989 dollars, based on 1989 bulk resin prices).

Suppliers of plastic resins are

Continued on page 36

*Frost & Sullivan is an international business information company founded in 1961. The company has offices in New York, London, Paris and Frankfurt, plus agents in Tokyo and Milan.*

Among the many trends affecting growth potential throughout the world of packaging in 1992, the environment still tops the list. After at least five years of intense debate, the packaging field and its critics seem to have barely scratched the surface of this complex issue.

We know, for example, that recycling of everything in the world is technically possible. But we still don't know what's economically feasible. Little by little, the costs of recycling are coming to be felt. It's not too early to begin redirecting our ecological energies.

As the editors of PACKAGING see it, recent moves by leading retail-products packagers toward source reduction could prove to be of longer-lasting significance than much of what's been said so far about post-consumer package recycling.

When looking at simplified, conservative, efficient-looking packaging, consumers see something they like. Let's hope lawmakers take notice, too.

**Lingering a little longer**

The recession has without a doubt lingered longer than expected. Low consumer confidence has been the meanie. And if the recovery proves uncommonly weak, it might well be because consumers continue saying, "Prove to me I need to buy this."

Many people who are finally spending some of their discretionary income are looking for ways to spend it without appearing irresponsible.

This is having its impact on packaging. Endorsement of source reduction by end users is leading to tangible evidence of increased packaging efficiency. As a result, end users and suppliers alike are starting to look like good guys instead of bad guys, whether they've bought into recycling or not.

**A long, hard look**

To great extent, new legislation affecting packaging is being driven by environmental concerns, but there's much more to it than that. The aggressive new director of the Food and Drug Administration is shaking up an agency that had been deservedly accused of low effectiveness and poor ethics. David Kessler is taking a long, hard look at packaging.

He appears to be an advocate of truth in

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## Materials Must Offer Value To Excel

**Peter J. Mooney**
Vice President
Business Communications

In the 1980s so far, buying patterns have been impacted by the recession and the pervasive sense of erosion of living standards. Two years of decline in the rate of growth of GNP, a rise in unemployment and higher taxes have made us all more stoic in our consumption patterns.

**Consumers** are no longer roaming the aisles of grocery stores and hardware stores impressed by imaginative packaging designs and other product enhancements. They are looking for cost savings in the amount of the product they buy, in the types of products they buy and in packaging.

Superimposed on this consumer mindset is the legacy of

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*Business Communications Co., Norwalk, Conn., has been engaged in materials-related market research since 1971. Peter J. Mooney is director of research at BCC and head of its Plastics Research Div.*

## A Dual Turn-Around Seems Likely

**Paul Schreiber**
Manager, Packaging
Kline & Co.

Important driving forces in the U.S. packaging market in 1992 will be the hoped-for economic recovery, continued environmental pressures for new technologies, concentration on core business by suppliers and the beginning of a more global outlook.

**A recovery** in the economy will affect mostly cyclical, price-sensitive packaging markets such as corrugated containers, an industry seeing depressed profits in 1991. Other packaging markets—particularly packaged foods, cosmetics and pharmaceuticals—are much less cyclical and therefore will recover more slowly. Other packaging markets dependent on a good recovery

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*Kline & Co., is an international business and consulting firm with headquarters in Fairfield, NJ, and principle offices in Brussels; Yokohama, Japan; Hong Kong and Melbourne, Australia.*

## Outlook Appears Mixed For Containers

**William P. Weizer**
Vice President
The Freedonia Group

Demand for food containers in the U.S. will increase 1.3% per year to 88 billion units in 1995.

Trends toward single-serve containers will continue based on consumer desires for convenience.

**Plastics will continue** to post gains vis-a-vis other materials, although their growth will slow due to renewed competition from glass, metal and paperboard.

The continued diffusion of the microwave oven will benefit plastic and paperboard trays along with frozen and other prepared foods.

Demand for plastic containers is forecast to increase 3.3% per year to nearly 33 billion units in

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*The Freedonia Group Inc., Cleveland, Ohio, is a business database/research company that provides detailed industry analyses and forecasts and competitive intelligence services.*

Baker: 'The green concept is a necessary outcome of the self-indulgent 1980s.'

'92

A 5.1% rise in beverage shipments is projected—a healthy pace

The value of exported drugs, expanding rapidly, should grow by 26%

The home-appliance industry will see a 4.6% jump in shipments during 1992

The major end markets for packaging will be looking for innovation

slipped in 1990 and this trend continued into 1991. Spending on durables was down 4.8% in 1991; nondurables spending fell 0.8%. Expenditures in both categories are forecast to be up in 1992: durables by 2.5%; nondurables by 1.4%.

To find the strongest areas of packaging growth, it is important to look at the major end markets for packaging products: foods and beverages, pharmaceuticals and medical products and household products.

**Retail sales of foods**, including restaurants and grocery stores, total over $506 billion annually. Food shipments totaled almost $398 billion in 1991—a 0.2% rise over 1990 shipments. Food shipments are expected to rise 3% annually through 1993.

Beverage shipments, a small but fast-growing piece of total food shipments, were only slightly affected by the economic downturn. Consumers have continued to buy beverages at a healthy pace: Shipments were up 2.7% in 1991. A 5.1% rise in 1992 is projected.

While overall consumer spending stagnates, spending on medical services and pharmacy products continues to grow and will create increasing need for new packaging. The United States is second only to Japan in terms of per capita pharmaceutical consumption, and the amount of drugs consumed in this country continues to increase.

Despite a recession in other manufacturing sectors in 1991, output of drugs and medicines exceeded expectations and expanded 5.9%. This trend of steady growth will continue through 1992, and by year-end, pharmaceutical production will have expanded 4.0%.

The value of shipments of pharmaceutical preparations increased 9.5% in 1991, mostly due to price increases. Consumer prices of drugs and medicines rose 8.2% in 1991, twice as fast as the general consumer price index. In 1992, shipments are forecast to increase 9.0% with prices rising 6.6%.

**The value of export drugs** has been expanding rapidly since the 1980s. In 1991, the value of exports jumped 25% to $1.25 billion, accounting for about 3% of all manufacturers' shipments. In 1992, the value of drugs exported should grow by at least 26%.

After four consecutive years of declines in total shipment volume, the appliance industry will see a 4.6% jump in shipments in 1992. Although shipment declines occurred in 1991 for a broad range of appliances, there are some encouraging signs for 1992. For example, recent Conference Board surveys of consumer buying plans for the first quarter of this year indicate an increase in appliance purchases.

A challenge for all companies is how to react to environmental legislation and consumer concerns. Product packaging is the first thing consumers see when buying a product, and they are increasingly looking for innovative and environmentally friendly packaging.

**The "green" movement** is a natural and necessary outcome of the self-indulgent 1980s, but it will not be a short-lived trend. Packaging which responds to the concerns of the marketplace will continue to win the consumer's dollar.

The major end markets of the packaging industry will all be looking for packaging innovation. Price remains a vital piece of the puzzle.

Glass container prices will rise at a moderate pace in 1992 and 1993 with increases of 1.1% and 2.7%. Some of the slowdown will be caused by competition from other substitute and recyclable materials such as plastic.

Steel can prices will also be growing at moderate rates of 2.2% and 2.1% in 1992 and 1993.

Paperboard prices are more volatile, dropping 4.2% in 1991, and increasing 4.5% in 1992 and 2.4% in 1993.

Paperboard fiber drum prices will follow a similar pattern, but with less dramatic swings. Drum prices rose 1.9% in 1991. A 5.4% price gain is anticipated in 1992 before a slowdown to growth of 1.3% in 1993.

Prices for paper boxes and fiber cans are slowing or declining. Fiber can prices grew an amazing 10.5% in 1990, but slowed dramatically in 1991 to 1.6% growth. Paper box and container prices grew at an imperceptible rate of only 0.1% in 1990 and dropped 1.1% in 1991. Both of these containers will remain a bargain over the next few years as their prices remain lower than general inflation rates.

**Other bargains appear** to be in plastic packaging and aluminum cans. One contributor to this is the supply of recyclables back into the system, which reduces the demand for new plastic or aluminum containers.

Aluminum can prices declined 0.2% in 1991, preceding a 2.3% rise in 1992. Slight growth is expected to ensue as prices rise only 0.9% in 1993.

The bargain-basement packaging material for the next few years is plastic. Prices dropped in 1990 by 2.0% but picked up some ground in 1991 with a rise of 1.6%. Demand could slow somewhat. In response, prices should drop 3.5% in 1992 in an attempt to stimulate demand. □

**PRODUCT SHIPMENTS IN MAJOR PACKAGING MARKETS**

**(Annual percent change)**

| | 1989 | 1990 | 1991 | 1992 | 1993 |
|---|---|---|---|---|---|
| Foods | 8.0 | 4.6 | 0.2 | 3.0 | 3.0 |
| Beverages | 5.3 | 1.4 | 2.7 | 5.1 | 2.5 |
| Drugs, soaps and toiletries | 12.1 | 6.4 | 6.9 | 8.9 | 7.8 |
| Major appliances | −1.1 | −6.7 | −6.1 | 4.6 | 3.3 |

Source: Dept. of Commerce, Assoc. of Home Appliance Manufacturers. Forecast: Cahners Economics

superiority on the part of U.S. manufacturers.

Continued innovation by packaging machinery manufacturers will also be a key propellant of growth in this industry in 1992 and beyond.

**Some of the most important** technological trends include self-diagnostic capabilities, microprocessor control and fully automatic machines. Electronic features, from simple solid-state controls to programmable logic controllers, have dramatically increased the ability to control and diagnose individual machine functions. In addition, electronics expand machine and line flexibility and improve the reliability of the entire packaging process.

Shipments of labeling and related machinery are expected to increase 7.2% annually during the 1989-1994 period, exhibiting the highest growth among the various packaging machinery segments. Shipments will increase about 8.5% in 1992 over 1991, reaching $400 million.

The increasing availability of pressure-sensitive labels has allowed manufacturers to produce labeling equipment that is fast, efficient, simple to operate and service, and accurate—a trend that will continue to benefit this segment in the 1990s.

**Technological innovation** and wide utilization across a range of packaging operations will contribute to above-average growth for labeling and related machinery in 1992. The current trend toward the use of labels and codes inside packages for promotions, on or inside the package for traceability, and outside the package for product identity and/or production tracking will create a strong demand for labeling machinery and equipment in 1992.

The market share and growth expectations for wrapping and film packaging machinery are similar, although slightly slower, than those for labeling machinery. Shipments will increase about 38% during the 1989-1994 period.

**Horizontal wrappers** will provide the primary growth stimulus in this segment, due to product innovations including pre-programmed changeover, servo-driven crimper speeds and electronic control of web tension.

Shrink-wrap and stretch-wrap machinery will not fare quite as well, however, due primarily to competitive pressures from alternative packaging methods.

Cartoning and multipacking machinery shipments will see slightly below-average growth over the intermediate to long term. Shipments in 1992 are projected to increase about 6% over the 1991 level to $270 million, and by 1994 shipments will reach $300 million. Improvements in cartoning machinery capability, ease of operation and reliability will promote growth in this segment in the 1990s.

Shipments of case-forming and related machinery are projected to increase at a pace in line with the aggregate packaging machinery average, or just over 7% in 1992 to $265 million.

**Continued enhancements** in the flexibility of case-forming machinery, particularly computer-adjustable machines, will be the key to growth in this segment. Innovations include compact case formers that are compatible with all types of case-taping equipment.

Shipments of vacuum and filling machinery will rise less than 6% this year, reaching approximately $245 million. Growth here will be somewhat slower than that of the previously discussed machinery segments, mostly because usage is generally restricted to applications in the food and beverage industries.

In addition, the increasing use of flexible packaging materials will restrict growth somewhat, since they often utilize machinery that performs the entire form-fill-seal process.

Growth for vacuum and filling machinery will maintain an upward trend. Increasing sales of soft drinks and other beverages and the growing popularity of convenience in the form of microwavable frozen foods to promote demand for this machinery.

**Form-fill-seal machines** may be divided into horizontal and vertical types—each accounting for about half of the units in operation. Shipments in 1992 are projected to reach approximately $165 million—an increase of over 7% from this year.

The ability of form-fill-seal machinery to perform multiple functions and to interface easily with other existing packaging machinery will promote healthy shipment growth of over 35% between 1989 and 1994. Improved operating performance through the use of computerization will also spur growth. Newer models offer microprocessor-based control systems which deliver high-speed, high-efficiency operation.

**The recent historical** performance for thermoforming and related machinery has been stagnant—a trend that is expected to be reversed in the 1990s. Although per annum growth—5.4% through 1994 to $100 million—will remain below the aggregate packaging-machinery average, shipments of thermoforming and related machinery will accelerate over the intermediate to long term. This will be due to new products and general improvements in machinery flexibility and efficiency.

Shipments of capping, sealing and lidding machines, which have been relatively sluggish since the mid-1980s, will continue to suffer from the affects of market maturity in the beverage industry. Shipments of these products will increase about 4% this year to $85 million.

Accumulating machinery will experience minimal growth, partly because other packaging equipment is becoming more automated and is operating at higher speeds.

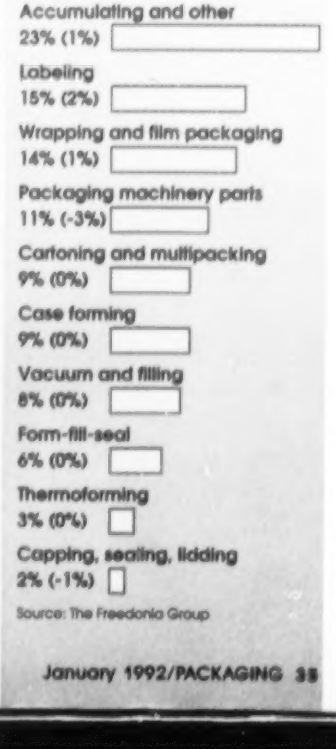
Testing, inspecting and weighing machinery will experience above-average growth due to growing requirements for accuracy. Demand for built-in automatic fault correction is becoming increasingly common among users and is expected to promote growth throught the forecast period. □

Brogan: 'Some of the most important trends include increased electronics.'

'92

**SHIPMENTS OF PACKAGING MACHINERY, 2000**

**Labeling and related machinery, representing 15% of the total market for packaging machinery in 1989, should see the fastest growth of all segments by 2000, at 2%. Percents shown are shares of market. Those in parenthesis reflect change from 1989.**




Source: The Freedonia Group

McDonald: 'Trends are pointing to more plastics in packaging, not less.'

'92

Various forms of aseptic packages should soon ring up $3.3 billion in sales

Metal cans should move from 525 to 640 million units with a retail value of $256 billion

In plastic cups for aseptics, growth to 3.6 billion units is foreseen through 1995

Growth in blister packs for drugs is a major development in the fast-growing field

generally upbeat about future prospects for what looks to be a steady growth market. Moreover, although health-care packaging takes a relatively tiny slice (less than 3%) of total U.S. plastics production, suppliers are happy to market to the health-care packaging industry. Some are aggressive in their commitments, willing to make special grades of plastic and to work closely with end users as well as selling to intermediate converters.

We have examined a number of problems involving plastics in health-care packaging, and their solutions. For example, one way to meet health and environmental concerns regarding disposable plastic packaging is with reusable plastic devices containing more expensive polymers, like polysulfones, that can withstand such processes as repeated autoclaving.

Frost & Sullivan finds trends pointing toward more disposable plastic packaging, not less, and at the expense of glass and metal.

**Among those trends**, blister packaging for pharmaceutical products is one of the most significant. Long preferred in Europe, thermoformed blister packs are beginning to catch on in the U.S., and beyond their use for cold medicines and other OTC products.

They have numerous advantages, such as less chance of contamination, less exposure to humidity, easier counting of daily doses, better tamper-resistance. And costs have come down relative to bulk packaging in bottles. Blister packaging is now actually less expensive than bottle packaging for counts of 100 or less. However, American manufacturers have a large investment in bottle-filling machinery. Then, too, pharmacists like to be part of the dispensing chain.

Aseptic packaging will soon ring up $3.3 billion in sales by preserving foods and beverages long-term in plastic and paper containers.

Anyone who has bought fruit juice in a paper-and-foil brick carton has already seen evidence of this trend. The technology, used commercially in Europe since the 1960s, was not available in the U.S. until the FDA cleared hydrogen peroxide as a packaging sterilant for an array of polymer materials in 1984. (Aseptic packaging sterilizes the food or beverage and the container separately; prior to the FDA ruling, it could only be used with metal or glass containers that could withstand superheated steam.)

**This new technology** has enabled food packers to introduce a variety of shelf-stable food products in lower-cost packaging, without the need for refrigeration. Frost & Sullivan predicts an $800 million increase by 1995 over the $2.45 billion market for aseptic goods that existed in 1990. Looked at another way, there were nearly 7.4 billion units of foods and beverages sold in aseptic packaging in 1990; by 1995 this will near 10 billion units.

In addition to cost advantages for the producer—lower energy consumption, transportation/distribution savings from less weight, and reduced space requirements—the shorter sterilization time required in aseptic packaging yields better taste and texture in the food product than is the case with standard alternative packaging.

In 1990, the brick-style carton accounted for 58% of all aseptic packaging by units, whereas plastic cups represented 35%, and metal cans 7%. In the future, Frost & Sullivan projects that the 4.26 billion units sold in brick-style cartons in 1990 will open up to 5.79 billion by 1995. In dollars, this constitutes a rise from $1.69 billion to $2.3 billion, making up some 70% of the market throughout those years. The preponderance is in fruit drinks.

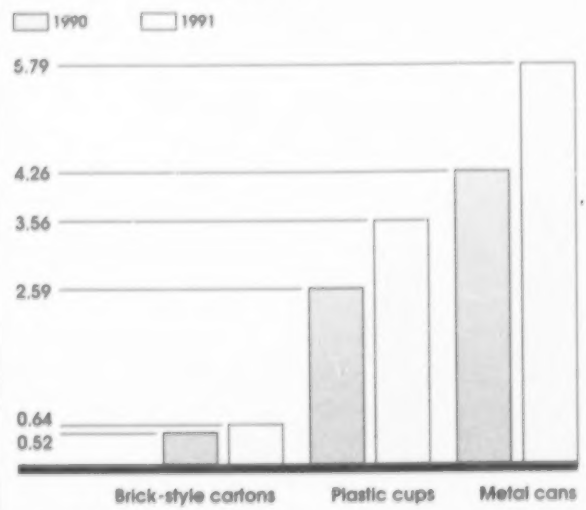
In plastic cups, a gain of 2.59 to 3.56 billion units is foreseen 1990-95, with a corresponding increase in dollars from $550 million to $745 million. Coffee creamers are the hottest product category, with 48% of volume in a unit basis.

Metal cans are used primarily for puddings and yogurt, but also for cheese dips and other products. Here, a gain from 525 million units to 640 million units is predicted, with a retail value of $210 million in 1990 to $256 million by 1995. □

**U.S. FOOD AND BEVERAGE MARKET BY PACKAGE TYPE**

**Despite negative publicity regarding their environmental impact, paper-based cartons continue to grow in use for the aseptic packaging of foods and beverages.**

Total 1990 market: 7.37 billion units
Total 1991 market: 9.99 billion units




Source: Frost & Sullivan Inc

**Mooney: 'The need to do right environmentally clashes with traditional business .'**

**'92**

- The drive to thin-wall packages continues in this era of source reduction
- In studies of comparative life-cycle performance, no one material dominates
- The most difficult call for the 1990s in packaging materials is plastics
- Despite intense pressures, no material will be legislated out of the arena

concern for the environment. We all became concerned with over-packaging in the 1980s. This concern is now reinforced by the growing awarenesss of the cost premium in such a packaging system. The drive to thin-wall packages—bottles, film bags, cans, etc.—will continue into the 1990s as we recognize the economic and ecological implications of excessive packaging.

**"Doing the right thing"** from the standpoint of the environment will clash with business's traditional mandate to maximize profits or minimize losses.

In the plastics field, the prices of some virgin resins used in flexible and rigid packaging have fallen below the prices of recycled resins. This stems from a glut of materials on the one hand and the high costs of retrieving, cleaning and reprocesssing post-consumer plastic packaging items on the other.

Unless legislated, few food or non-food packagers in the current economic climate will opt for higher-priced recycled resins for the questionable advantage of noting such ecological correctness on their product packaging.

**Will the current concern** over cost-savings evaporate once GNP and job growth resume or will it have been imprinted permanently on our packaging materials and design preferences?

Will our new eco-consciousness survive the new-found realization that the U.S. economic machine doesn't generate as much affluence as we had once thought and hoped? If it doesn't, concern for the environment may simply become part of the unsolvable, age-old confrontation between the haves and the have-nots.

Our sense is that materials that best promote cost-effective and versatile packaging with the least compromise of environmental prescriptions for rational material use and re-use will win out.

We have, in our studies of packaging-material competition, drawn up a ranking of comparative life-cycle cost-performance. No one material dominates, so we don't presume to settle the debate over optimal, "whole-life" cost-effectiveness of the various materials. But a few salient notions do emerge.

First, it is hard to defend steel as the material of the future in packaging. The same applies to glass, since we can deliver transparency in lighter and less-hazardous packages today.

**The future lies** with lighter-weight and versatile materials—aluminum, paper, plastics and combinations.

The handicap that aluminum faces is versatility. Other than foil, aluminum is limited as a flexible packaging medium. Moreover, it is hard to come up with creative and convenient aluminum packaging design (e.g., easy opening or handles for rigid containers).

Paper, having lost share to plastics in the first half of the 1980s on the grounds of inferior barrier properties, durability and versatility, is now seen as more benign in the post-consumer product environment than most materials.

The most difficult packaging material "call" for the 1990s is undoubtedly plastics. There is no question that this is a cost-effective and energy-efficient set of materials with unparalleled versatility. The limitations that plastic packaging material purveyors face are, in our view, more perception than reality.

**Because suppliers** of non-plastic materials have successfully questioned the recyclability of plastics, the plastics industry has had to scramble to prove its case and catch up with the aluminum, steel, glass and paper. And yet, with the exception of aluminum, efforts aimed at building and expanding recycling infrastructures have resulted in mountains of unusable newsprint, battery scrap, steel scrap, commingled plastics pellets, etc.

Thus, our forecasts for the trends of packaging material consumption into the 1990s are hardly controversial.

Plastics will continue to gain market share whereas glass and steel will continue to trend downward. Paper will be the staunchest competitor to plastics in both flexible and rigid packaging, whereas aluminum's growth pace will slow as its share of beverage containers tops out and it largely fails to transfer that strength to other container markets.

The economic realities we face in the global marketplace of the 1990s will constrain implementation of materials recycling and re-use. At least, this will progress more slowly than envisaged in the days of dynamic growth in the 1980s. The battle for environmental correctness won't be given up: it will just take more time, resources, and private-sector/public-sector cooperation.

No material will be legislated out of the packaging arena. □

**SHIPMENTS OF PACKAGING MATERIALS**

**(Average annual percent change)**

| | Aluminum | Glass | Paper | Plastics | Steel |
|---|---|---|---|---|---|
| 1985-1990 | 3.0 | 0.9 | 2.2 | 6.4 | 1.8 |
| 1990-1995 | 2.5 | 0.5 | 2.5 | 6.0 | 1.0 |
| 1995-2000 | 2.0 | 0.2 | 3.0 | 5.5 | 0.8 |

Definition and sources:
Aluminum—Volume (pounds) of aluminum in packaging; Aluminum Assoc.
Glass—Volume (units) of glass containers; U.S. Dept. of Commerce
Paper—Volume (real dollars) of paper in packaging; U.S. Dept. of Commerce
Plastics—Volume (pounds) of plastics in packaging; Society of the Plastics Industry
Steel—Volume (tons) of steel in containers, packaging and shipping material; American Iron and Steel Institute

**Schreiber: '1992 looks like a year of improvement in the consumer perception of packaging.'**

- Microwave trends should benefit cost-effective paper packaging
- Suppliers are simplifying film structures that provide excellent barriers
- Risk avoidance seems likely to slow the pace of packaging innovation
- U.S. suppliers will seek expansion overseas, especially in Europe

are expensive prepared foods.

Environmental pressures on packaging often go through a crisis stage before more realistic and pragmatic solutions prevail. A prime example from outside of packaging was the demand for degradable trash bags and liners, a bubble which burst when the FDA and several state attorneys general brought suit against a major supplier. A market in degradable films once forecast at 2.2 billion pounds will be only a few hundred million pounds in 1992.

PVC is the packaging resin that is expected to come out of such a crisis stage in 1992. Actual or pending bans on PVC packaging in Europe and advocacy of similar actions by some environmentalists in the U.S. caused some packagers to abandon PVC in 1991. Kline forecasts that, in the long run, PVC will survive this crisis with some loss of market share. This will be least in PVC film packaging with continued growth, some loss of market in such thermoformed packaging as blister packs and trays, resulting in flat demand, and declining sales in bottles.

PET is showing signs of becoming an environmental star. Suppliers have developed methods for closed-loop recycling of PET soft-drink bottles. In both cases, the recovered PET resin has a purity equal to virgin resin.

Environmental considerations are also an important driving force in high-barrier films. Even though PVDC is used in minute quantities (often only 0.1 mil thick) to provide excellent oxygen barrier, it is often painted with the same "PVC brush" by environmentalists. This may cause some increase in the use of EVOH as the barrier resin on high-barrier films.

In addition, multilayer structures—especially those that combine paper, foil and film—are under attack as nonrecyclable and a problem when incinerated. Therefore, several barrier-film suppliers are developing simpler structures said to offer equal barrier properties. Two prime targets are the so-called juice boxes and the paper/film/foil structures use for dried foods.

**Lower costs** and simpler structures should result in an increase in use of such films as nylon and polyester. On the other hand, glass-coated films, a new technology that at first looked like the next revolution in transparent barrier films, will find only niche applications through 1996. Further growth will depend on reduced costs and greater confidence among food packagers.

Packaging markets in 1992 will see continued moves to packages that offer increased value for the dollar. For microwavable packaging this means a continued trend to all-paper, plastic-coated paper, and even aluminum trays as less-expensive packaging than CPET and other all-plastic packages.

**We also believe** that 1992 will see a continuing dearth in the number of new innovations in packaging, caused by a combination of risk avoidance by both packaging suppliers and packaging users during a recession, and the distraction of responding to increasingly intense environmental pressures. Most innovative packaging in 1992 will be directed toward greater "environmental friendliness," more source reduction, fewer multilayer structures and better recyclability.

As in other industries, there will be fewer leveraged buyouts of packaging suppliers during 1991 in response to less availability of high-risk capital. Instead, packaging suppliers are more likely to use acquisition and divestitures to strengthen their core businesses. In addition, more U.S. packaging suppliers will seek expansion overseas, especially in the European Economic Community, which keeps growing in size. It already exceeds the USA in population and may soon pass it in GNP also. In a like manner, we expect Canadian packaging suppliers to more aggressively move into the United States than U.S. suppliers into Canada.

Possibly the best news for both packaging suppliers and users, 1992 has every promise of being the year in which the very environmentally unfriendly perception of packaging by most consumers will begin to change, especially as directed toward plastic packaging. □

### INTERNATIONAL FORECAST ON THE HORIZON

Packaging is increasingly becoming a global industry with barriers crossed by international brands. PACKAGING will present a special report in April. For now, here are some highlights from research organization Pira International.

Global trends can be summarized into half a dozen areas: a general slowdown in international growth, the splintering of traditionally larger markets, increasing levels of competition, growing exports from developing countries, shorter product-development cycles and an overall globalization of products and packaging.

Consumer-oriented packaging, which now accounts for $110 billion or 63% of the world market, is expected to be worth approximately $130 billion in 1994.

North America is expected to remain the largest packaging market, with Europe and Asia ranked second and third. Growth to 1995 is expected to be strongest in the Asia Pacific region. Eastern Europe and the Soviet Union represent enormous potential.

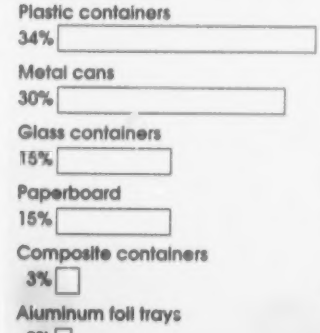
Beverages and cosmetics/healthcare are expected to show the largest growth, with the former forecast to increase by 6.1% annually and the latter by 5.5%. Food and other markets will continue to grow at the slower rate of 1.6%. On the technology front, most developments are likely to be led by environmental concerns. A new generation of barrier materials is certain to become more important.

Weizer: 'Makers of consumer products will increase use of packaging as a marketing tool.'

'92

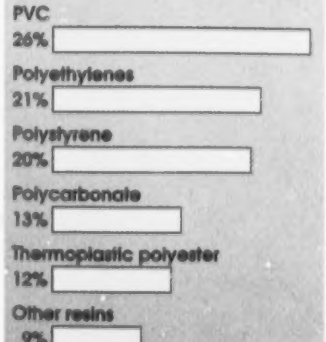
**DEMAND FOR MATERIALS IN FOOD CONTAINERS, 1990**

Plastic containers now lead in demand among all materials used in packaging foods. Percents shown are shares of total market: 82 billion units.




**DEMAND FOR RESINS IN HIGH-VISIBILITY PACKAGING, 1990**

Of all resins used in the manufacture of "hi-viz" packaging, PVC is in the lead and expected to stay there. Percentages shown are shares of total market: 120 million pounds.




Source: The Freedonia Group

1995. Growth will be based on plastic's light weight, microwavability, transparency, squeezability and shatter-resistance.

In unit terms, the foods market is dominated by polystyrene foam trays for in-store packaging of produce, meat and baked goods. The most vibrant segment will be ovenable trays for microwave entrees and side dishes, with CPET and polypropylene showing the strongest gains.

Metal cans will hold their ground at 25 billion units through 1995. Declining demand for canned vegetables and fruits is being offset by increasing demand for pet foods and seafood.

Loss of market share by glass containers to plastic will slow considerably due to rising resin prices, stronger and lighter glass containers and a more cost-competitive glass-container industry. Glass will also benefit from its pristine environmental image and barrier properties.

Paperboard container demand will increase 1.1% per year to 13 billion units, with gains based on demand for coated paperboard trays used in microwavable meals.

Composite cans will be displaced by flexible packaging for snack foods and prepared bakery goods in the doughs segment.

Frozen foods and other prepared foods will show the industry's strongest growth based on the introduction of near restaurant-quality frozen, refrigerated and shelf-stable entrees and side dishes. Dairy products will grow based on the popularity of yogurt and pudding in single-serving HDPE and PP cups.

**Demand for caps and closures** in the U.S. is projected to increase 6% per year to $2.5 billion in 1995.

Growth will be stimulated by the increasing use of higher-value closure systems to upgrade the convenience, security and aesthetic value of packaged consumer goods.

Plastic closures, particularly dispensing and child-resistant types, will provide the best opportunities based on performance advantages, design flexibility and value-added characteristics.

Metal and metal-composite closures will diminish in importance due to higher overall costs and reduced applications as a result of the widespread market penetration of plastic containers.

Foods and beverages will remain the largest markets, although more rapid growth is expected in lower-volume household chemicals.

Dispensing devices will be increasingly incorporated on containers for liquid foods, liquid pharmaceuticals, cosmetics, personal-care goods and household chemicals.

Child-resistant closures will enjoy good growth due to government regulations requiring safety features on pharmaceutical and selected household-chemical containers and because of the increasing medication needs of an aging population.

**Foods and beverages** comprise the largest two end uses for caps and closures. However, end uses involving household chemicals, cosmetics and toiletries as well as medicinal and health products will exhibit strong growth. Demand for household chemicals will be boosted by the use of more expensive closures for multi-use products. Advances in pharmaceutical packaging will be tempered somewhat due to competition from non-closure packaging such as blister and skin types.

Household-chemical packaging in the U.S. will increase in demand by 4.6% per year to $815 million in 1995. Environmentally friendly packaging, including 2-liter PET refill bottles, paperboard refill cartons and recycled HDPE containers, will create strong opportunities.

Intensifying competition among household-chemical producers will create favorable demand for functional and value-added packaging such as trigger-spray dispensing bottles, non-aerosol pressurized containers and decorative paperboard windowed packages.

The value of containers consumed by the household-chemical industry will increase 4.2% per year to $490 million in 1995. Functional refill and recycled-plastics bottles for liquid cleaning preparations will exhibit the fastest growth in demand. High-barrier plastic jars will also create opportunities as replacements for metal cans in paste and solid-wax packaging applications.

Non-aerosol pressurized containers will capture significant market share from traditional aerosol cans for air-fresheners and room-deodorizers.

Continuing improvements in plastic materials and processing will cause glass containers to lose their few remaining household-chemical applications.

Multi-purpose and specialty household cleaners will remain the largest end use for household-chemical packaging, with demand reaching $220 million in 1995. PET refill bottles for glass cleaners and specially designed angle-necked bottles for toilet preparations will exhibit the best growth in the segment.

Packaging demand for household laundry chemicals will increase 5.1% per year to $205 million. Paperboard cartons will dominate this segment.

The value of raw materials in household chemical packaging will increase 3.3% per year to $370 million in 1995. HDPE resins will exhibit the most favorable growth. Polypropylene will also rise impressively due to broadening opportunities in child-resistant and dispensing closures.

Tin-plate steel will ward off challenges from aluminum and plastic in aerosol can applications, but lose some momentum to the expanding penetration of plastic trigger-spray bottles.

Paperboard will benefit from the rising popularity of fragrance units, but will continue to generate most demand from shopping container and labeling end uses. Weight, cost and breakage disadvantages will cause glass to eventually disapppear as a household-chemical packaging material. □

## Doing things the same old way is risky, since use of the package as marketing tool is growing

'92

- Growing consumer demand for organoleptically superb foods is driving R&D
- America is aging, but product marketers seem to be ignoring the elderly
- When the public thinks about packaging, drugs and foods get most attention
- The amount of packaging materials to be bought in 1992 totals $78 billion

advertising. That means, among other things, accurate, realistic, meaningful messages on labels. PACKAGING's most recent consumer survey (see June 1991) shows that a distressingly large number of consumers think product labels are downright misleading and dishonest. Under Kessler, the FDA will try to put an end to that.

The Consumer Product Safety Commission is working to change the testing protocol for child-resistant closures. The deadline keeps being pushed back, but don't let that fool you: The commission is not just playing around.

All these demands and more can and will be met by the packaging field . . . provided sufficient effort is put into research and development. The Cahners Economics Business Confidence Index shows that R&D investment by American industry in 1991 was just OK.

### The same old way

Recession or no, doing things the same old way is risky. As a result of our consumer research, the editors of PACKAGING have documented changes in the way consumers approach packages and the products they contain. A good example is microwavable meals. The technology remains impressive; the packaging is attractive; the products are reasonably priced. And yet consumers are not happy with every single microwave food that hits the market.

Growing consumer demand for organoleptically pleasing packaged foods will prompt materials scientists to do much more in the future than they have in the past to provide it.

Here's another growth area for packaging R&D: We reported more than a year ago on packages that were particularly difficult for older consumers to use.

Since we published that report, almost nothing has changed. The American population is aging rapidly, and the elderly are thus becoming an increasingly powerful demographic segment of the marketplace. But they seem to be being ignored by those who market packaged products to them.

### Packaging as sales tool

The package as marketing tool is skyrocketing in importance.

On this point, professionals in advertising, product marketing and market research as well as packaging seem to agree wholeheartedly: Developing a great package is likely to be the most effective sales strategy of all.

When the American public thinks about packaging, the tendency is to focus on foods and pharmaceuticals. Many packaging professionals do so too, simply because that's where so much of the innovation takes place. But to get a feeling for the real importance of packaging, we all have to consider numerous different manufacturing industries. It is only then that we realize how big and influential this business is.

Working with a proprietary methodology, PACKAGING has developed forecast figures across the board. (See table.) Our estimate of the amount of packaging materials that will be purchased by all these industries during 1992: $78 billion. No wonder the field of packaging has been under attack.

### A few more predictions

Here are a few other predictions we feel confident in making.

- The debate about corrugated will continue following changes in the way this material is tested and rated.
- The search for qualified workers to run increasingly sophisticated packaging machinery will be a time-consuming, expensive one.
- Protecting those workers from injury will be especially important as health-care costs continue to rise.
- Quality, in materials and machines, will grow in importance as competition increases for share of market.
- Packages that can hang from a peg, especially if the package is made of flexible film, will continue to grow in popularity among retailers and consumers alike.
- Turnkey suppliers of entire packaging systems will become more and more powerful as end users strive to boost accountability for packaging-line problems.

The coming year, as we see it, is full of challenges. But they are different from those of the past 12 months. ■

**PACKAGING CONSUMPTION FORECAST**

**(Value of packaging materials, containers, supplies)**

| | '92 Consumption ($ millions, current) | Percent Growth (1991-1992) |
|---|---|---|
| Foods | 27,506 | 6.4 |
| Beverages | 14,602 | 3.8 |
| Drugs, soaps, toiletries | 9,139 | 7.0 |
| Electrical machinery | 4,421 | 6.6 |
| Fabricated metals | 3,608 | 1.1 |
| Industrial chemicals | 2,657 | −1.4 |
| Instruments | 2,526 | 4.5 |
| Non-electrical machinery | 1,631 | 5.0 |
| Rubber/plastic products | 963 | 5.8 |
| Paper products | 929 | 6.8 |
| Tobacco | 909 | 5.6 |
| Transportation | 752 | 3.0 |
| Petroleum products | 505 | 1.7 |
| Stone, clay, glass | 292 | 6.6 |
| Primary metals | 128 | 6.3 |
| Other industries | 7,249 | −2.8 |

Source: PACKAGING magazine, Cahners Economics, U.S. Dept. of Commerce

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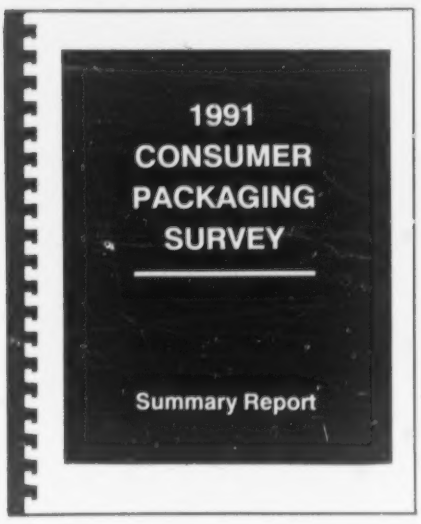
# CONSUMERS TALK ABOUT PACKAGING




PACKAGING's exclusive Consumer Survey shows you what consumers want and expect from packaging.

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